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TIMBER MANAGEMENT PLAN

NORTH PARK WORKING CIRCLE

ROUTT NATIONAL FOREST
COLORADO

REGION 2
1960

U. S. FOREST SERVICE

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SD431

TIMBER MANAGEMENT

PLAN

NORTH PARK WORKING CIRCLE

ROUTT NATIONAL FOREST
COLORADO

REGION 2
1960

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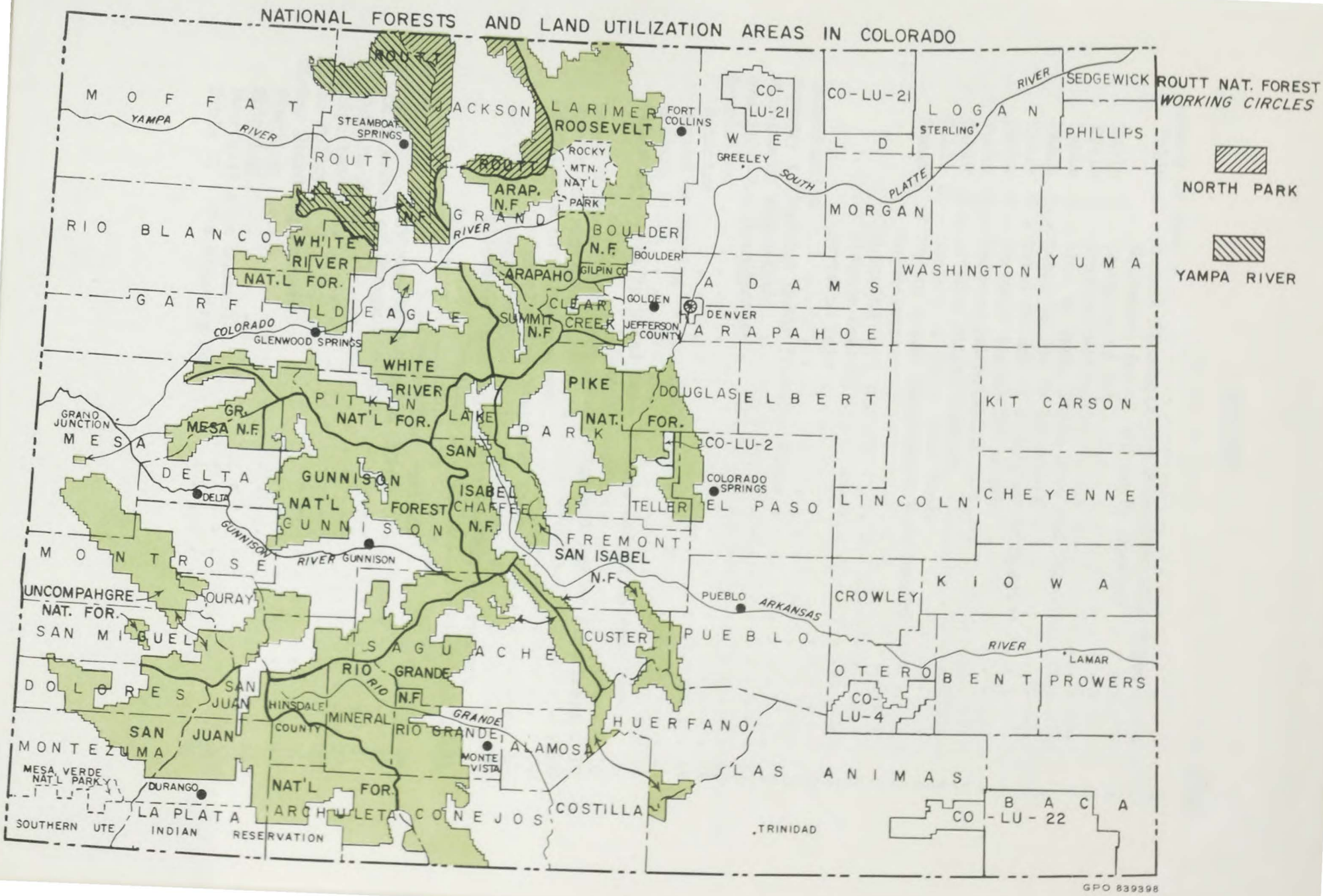
Initials	Date		Initials	Date
CCA	11/7/60	Timber Management	IJM	12/30/60
ML	11/18/60	Engineering		


NATIONAL FORESTS AND LAND UTILIZATION AREAS IN COLORADO
ROUTT NAT. FOREST
WORKING CIRCLES
NORTH PARK
YAMPA RIVER
ROUTT N.F.
ARAP. N.F.
ROCKY MTN. NAT'L PARK
BOULDER N.F.
WHITE RIVER NAT.L FOR.
ARAPAHO N.F.
SUMMIT N.F.
CLEAR CREEK
PIKE NAT. FOR.
PARK
PITKIN NAT'L FOR.
GR. MESA N.F.
GUNNISON NAT'L FOREST
SAN ISABEL N.F.
CHAFFEE
FREMONT
UNCOMPAHGRE NAT. FOR.
SAN MIGUEL
SAGUACHE
RIO GRANDE N.F.
HINSDALE COUNTY
MINERAL
SAN JUAN
RIO GRANDE
ALAMOSA
MONTE VISTA
MESA VERDE NAT'L PARK
DURANGO
NAT'L FOR.
ARCHULETA
CONEJOS
COSTILLA
LA PLATA
SOUTHERN UTE INDIAN RESERVATION
HUERFANO
LAS ANIMAS
TRINIDAD
CO-LU-22
CO-LU-4
CO-LU-2
CO-LU-21
CO-LU-21
MOFFAT
RIO BLANCO
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PITKIN
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HINSDALE
SAN JUAN
DOLORES
MONTEZUMA
LA PLATA
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COLORADO RIVER
GUNNISON RIVER
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ARKANSAS RIVER
RIO GRANDE
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SUMMARY OF PLAN

Table 1

Annual Allowable Cut from Regulated Types

Types	Area (Acres)	Volume
Lodgepole pine sawtimber types	1,440	11,200 MBF
Spruce-fir sawtimber types	780	9,500 MBF
Lodgepole pine poletimber types	1,900	3,500 MCF

Estimated Annual Volume by Species from Regulated Area

1. Sawtimber Volumes

Species	Sawtimber Type: Lodgepole Pine (MBF)	Spruce-Fir (MBF)	Total (MBF)
Lodgepole Pine	8,700	300	9,000
Engelmann Spruce	1,700	7,000	8,700
Subalpine Fir	600	2,100	2,700
Douglas-fir	100	100	200
Aspen	100	---	100
Total	11,200	9,500	20,700

2. Small Round Wood Volumes

Species	From Lodgepole Pine Poletimber Type (MCF)	From Residual Stand to be cut over in Lodgepole Sawtimber Type (MCF)
Lodgepole Pine and Associated Species	3,500	1,000

Table 2

Unregulated Cut

Total Volume Available for Cutting

Type	Area	Volume
Douglas-fir sawtimber	1,728 acres	11,544 MBF
Aspen poletimber	15,886	14,366 MCF

Table 3

Area by Ownership

Ownership	Commercial Forest Lands (Acres)	Non-Commercial (Acres)	Non-Forest (Acres)	Total (Acres)
National Forest:				
Unreserved	242,320	25,955	39,280	307,555
Reserved	--	12,950	12,521	25,471
Total		38,905	51,801	333,026
State, Unreserved	54,883	3,692	13,104	71,679
Private	2,535	636	1,802	4,973
Total	299,738	43,233	66,707	409,678

Table 4

Area of Commercial National Forest Land by Timber Type, Stand Size and Stocking Class
(Acres)

Timber Type	Large Sawtimber			Small Sawtimber				Poletimber				Seedling-Sapling				Non-Stocked	Total
	Med.	Poor	Total	Well	Med.	Poor	Total	Well	Med.	Poor	Total	Well	Med.	Poor	Total		
Douglas-fir	-	-	0	-	845	883	1,728	-	-	-	0	-	-	-	0	0	1,728
Lodgepole Pine	-	-	0	160	27,724	32,786	60,670	51,458	15,037	5,425	71,920	5,229	709	2,397	8,335	1,487	142,412
Limber Pine						310	310		10		10						320
Spruce-Fir	870	150	1,020	895	34,365	29,350	64,610	790	3,206	4,715	8,711	-	40	840	880	3,708	78,929
Dead Spruce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130
Aspen	-	-	-	-	-	-	1,325	-	-	-	15,886	-	-	-	1,590	0	18,801
Total	870	150	1,020	1055	62,934	63,329	128,643	52,248	18,253	10,140	96,527	5,229	749	3,237	10,805	5,195	242,320

Table 5

Total Volume for Commercial Forest Lands
By Ownership

	National Forest	State	Private	Total
Sawtimber MMBF (1)	1,275	149	4	1,428
Products MM Cubic Feet (2)	210	75	3	288

(1) In sawtimber size stands
(2) In both sawtimber and poletimber size stands

Table 6

Total Volume of Sawtimber by Species
in Sawtimber Types
National Forest Unreserved Lands

Sawtimber Types	MBF by Species: Douglas-fir	Lodgepole Pine	Subalpine Fir	Engelmann Spruce	Aspen	Total
Douglas-fir	10,275	415	358	496	0	11,544
Lodgepole Pine	4,570	355,585	23,766	68,557	4,570	457,048
Spruce-Fir	8,777	22,341	179,526	584,857	2,394	797,895
Aspen	0	0	350	0	8,403	8,753
Total	23,622	378,341	204,000	653,910	15,367	1,275,240

Table 7

Periodic Annual Net Growth Based on Past 10 Years
for Trees 5.0" d.b.h. and Larger

Type	Cubic Feet per Acre	Total for Type
Lodgepole Pine		
Sawtimber	+ 28.95	5,654 MBF
Poletimber	+ 49.13	3,533 MCF
Spruce-Fir		
Sawtimber	+ 26.59	7,469 MBF
Poletimber	+ 17.64	154 MCF

Table 8

Recommended Rotation

Type	Years
Lodgepole Pine	120
Spruce-Fir	140

Table 9

Cutting Budget Summary

North Park Working Circle compartments will be offered for sale in the following order of priority:

Compartment Number	Name	Remarks
Sawtimber Types		
29	Rock Creek	
10	Buffalo	
7	Arapaho	
14	Colorado Creek #1	
9	Beaver Creek	
15	Davis Creek	
14	Colorado Creek #2	
3	Damfino	
4	East Fork	
20	Michigan River	
5	West Fork	(To be sold this period & cut
6	South Hog Park	(in 1971-1980 FY Period.
Poletimber Types		
26	Parkview	Subject to establishment of a pulp plant at Kremmling, Colo.

Table 10

Summary of Major Road Needs

The roads listed below are in order of priority for construction and are needed for the harvesting of the allowable cut.

Road No	Road Name	Date for Survey (FY)	Date for Construction (FY)	Remarks
2035	Jack Park	1960	Complete	
2029	Jack Creek	1960	"	
2043	Rock Creek	Complete	1961	Operator Constructed
2047.2	Bundy Park	"	1961	" "
2047.3	Bundy Park	"	1961	" "
2049	So. Arapaho	"	1962	" "
2048	East Fork	"	1962	" "
2020	Hidden Lake	Current	1961	" "
2003	Davis Creek	1961	1963	" "
2001.1	State Line	1961	1963	ROW needed by 1962
2001.2	State Line	1961	1966	Operator Constructed
2001.3	State Line	1964	1966	" "
2119	Stump Park	1964	1969	" "
2000	West Fork	1967	1970	" "
1945	So. Hog Park	1964	1966	All Purpose

Summary of Timber Stand Improvement Work Needed

In the following summary the total long-range timber stand improvement job has been shown, along with the job to be done within the current 10-year period.

Regeneration

Planting: Table 17 gives a breakdown of the long-range and 10-year planting jobs. In summary, it shows that by the year 1980 a total of 48,799 acres of lodgepole pine type and 18,628 acres of spruce-fir type, or a total of 67,427 acres for both types, are to be planted.

The planting job for the 10-year period amounts to the following:

Lodgepole pine type	6,240 acres
Spruce-fir type	9,200 "
	15,440 acres

Seedbed Preparation to Aid Natural Regeneration: For the 10-year period, scarifying, slash burning, or other measures to obtain natural reproduction will be done on 6,000 acres of cutover lodgepole pine type and 5,000 acres of cutover spruce-fir type.

Thinning

Noncommerical thinning will be done on 9,600 acres of lodgepole pine to be cut over in sawtimber sales during this period. In addition, 2,000 acres of thinning of larger reproduction will be done on older cutover areas. Commercial thinning of about 2,000 acres of lodgepole pine poletimber type is planned for this 10-year period in a proposed pulpwood operation if a pulp mill is established near Kremmling, Colorado. The total thinning job needed in lodgepole pine poletimber stands amounts to 29,600 acres.

Disease Control

During the 10-year period, lodgepole pine dwarfmistletoe (Arceuthobium americanum, Nutt.) control will be done on 4,000 acres by poisoning, girdling or burning infected residual stands of less than 5 cords per acre on cutover areas. This 5-cord limit is subject to reduction if pulp operations prove practicable at less than this volume.

One-half of this, or 2,000 acres, will be done on areas currently being cut over. The remaining half will be done on older cutover areas.

Revision Date

This plan will be revised by June 30, 1971. Revision prior to this time may be made if necessary because of changed conditions.

TIMBER MANAGEMENT PLAN

NORTH PARK WORKING CIRCLE

Routt National Forest

INTRODUCTION

This working circle plan constitutes the 10-year action program. The action prescribed is necessary to meet the long-term objectives in the General Timber Management Statement for the Routt National Forest.

The plan will be revised by not later than June 30, 1971. Earlier revisions may be made if necessary to meet changing conditions.

Detailed Forest Survey data, from which this plan was formulated are found on the IBM sheets labeled "1957, Forest Survey, Colorado, IBM Sheets, Routt National Forest, Sample Unit 25" and filed in the office of the forest supervisor at Steamboat Springs, Colorado.

Compartment records containing maps, volumes, type areas and compartment descriptions are filed in the timber management atlas of this working circle. These records will be kept current annually for action taken within the compartments. The current actions to be recorded are: area and volume cut, in both the regulated and the unregulated types; stand improvement work done; and changes in ownership. This action will be recorded in a graphic and tabular form.

The working circle records will be maintained in the offices of the district rangers concerned.

SUMMARY OF RESULTS UNDER PREVIOUS PLANS

Comparison Between Actual Cut and Allowable Cut

During the 10-year period FY 1950-1959, the North Park Working Circle's cumulative actual cut was 85% of its allowable cut. Total plant capacity in the working circle is adequate to cut the full amount of the allowable cut.

Although the ratio of actual cut to allowable cut was the highest in Region 2, it is probable that the allowable cut could have been attained through a more aggressive program of timber sales promotion early in the planning period.

Regeneration

The only artificial regeneration accomplishment to date on this working circle has been the preparing of a seedbed to aid natural regeneration. This has been done by scarifying 20 acres of ground area.

Thinning

Noncommercial thinning of lodgepole pine has been done with sale-area-betterment funds on 297 acres.

Cull Removal and Release

This work consisted of removing logging-damaged fir and lodgepole pine and releasing the lodgepole pine understory. This was done on 407 acres.

Disease, Insect Control and Fire Control Accomplishment

Disease Control: Dwarfmistletoe control was done on 351 acres of lodgepole cutover area by poisoning or girdling the infected residual stand.

Insect Control: The Engelmann spruce epidemic in the early 1950's reached the southern end of the working circle. Control work was done from 1951 to 1953 on 3,344 acres of spruce-fir type. No other insect control work has been necessary in the working circle.

Fire Control: In the 10-year period 1951 to 1960, 24 fires occurred. Of these, 79% were on commercial timberland. The occurrence, by timber types, was 74% in lodgepole pine and 26% in spruce-fir. A total of 240 acres of national forest land was burned over in the 10-year period.

Area Put Into Optimum Growing Condition

A total of 1,000 acres has been put into acceptable growing condition, including areas thinned noncommercially and lodgepole pine areas on which dwarfmistletoe control work has been completed.

MANAGEMENT OBJECTIVES

The objective of this plan is to make all practicable progress toward attaining optimum growing conditions on commercial timber areas in the working circle and to provide for protecting these areas from such destructive agents as fire, disease, and insects. To accomplish this objective, the following must be done in this planning period. The action outlined is based on the fact that the existing sawmill capacity is sufficient to harvest the allowable cut of sawtimber.

1. Attain the allowable cut of sawtimber by FY 1963. The allowable cut of pulpwood will be attained 5 years after establishment of a pulp plant.

2. Assure adequate stocking within 5 years on all current cutover areas. Scarifying to expose mineral soil to natural seedfall and to reduce competition by other vegetation will be necessary on about 50% of the cutover areas in the lodgepole pine type and 80% in the spruce-fir type. In addition, on spruce-fir cutover areas, 300 trees per acre will be planted following cutting or scarifying in order to provide basic stocking. This will amount to 6,500 acres of spruce planting at the 300 trees per acre rate.

3. Reforest commercial forest land which is presently non-stocked, bring understocked areas into satisfactory production by fill-in planting, and reforest polestands that have been clear cut. There are 2,000 acres of spruce-fir and 12,000 acres of lodgepole pine commercial forest lands to receive such treatment in this period.

4. Improve growing conditions on current cutover areas by thinning overstocked regeneration on lodgepole pine clear-cut strips and patches. This will involve 80% of the current cutover areas, or a total of 9,600 acres. In addition, thinning will also be done on older cutover areas in the Pinkham Creek and Michigan River compartments. This job will amount to treating 2,000 acres.

5. Control dwarfmistletoe on lodgepole pine cutover areas having a residual stand of less than 5 cords per acre. On current cutover areas this will amount to 15-20% of the cutover areas or about 2,000 acres. Another 2,000 acres will be treated on the older cutover areas.

6. By taking the following action, keep commercial forest land fire damage within the annual PAR established in the fire prevention plan.

   a. On current cutover areas in a fuel-type class higher than MM, reduce to at least MM within 2 years after cutting.

   b. On older cutover areas in a fuel-type class higher than MM, provide for extra protection.

   The long-term "burned area objective" or "tolerable annual burn" for the 242,300 acres of commercial forest land is 194 acres.

7. Salvage all merchantable blow-down material currently through sales.

8. Establish additional industry to utilize small, round products. This job will be done through coordinated effort with adjacent forests and will be accomplished by 1965. Commercial thinning by this new industry is estimated to amount to 2,000 acres during the 10-year period.

MULTIPLE-USE COORDINATION

State Line Road, F.D.R. 2001, will open the headwaters of the Encampment River to heavy recreation use. This road, from the forest boundary to Hog Park, will be located and designed for all-purpose use but will be initially constructed only to the standard necessary to remove the timber.

No conflicts with other uses are anticipated under the information and instructions contained in the General Timber Management Statement, the Land Management Plan for the Western Colorado Subregion, the Land Management Block Plan for the Routt National Forest, and the Forest Service Manual and Handbook.

REGULATION

Regulation will be by area, with the allowable cut expressed in both area and volume. Control will be by 10-year periods. Undercuts that have built up during the 10-year period may be cut during the remainder of the same period provided that the total cumulative cut for the period does not exceed the allowable cut for the period by more than ten percent. The control will be through the sale and release of timber for cutting.

The financed cut for any one year is based upon volume and is comprised of timber from both the regulated and unregulated areas. The financial cut quota should be sufficient to meet both volume and area objectives for the forest as a whole.

If the present relationship between area and volume is found to be excessively variable for the forest as a whole, the volume allowable cut will be adjusted to be compatible with area regulation. No adjustments, however, will be made prior to the end of the first 5-year period.

Rotation

The rotations used in this plan revision are the same as used in previous plans, since there is no basis for a change. The rotations are:

Lodgepole pine type	120 years
Spruce-fir type	140 years

The period includes 5 years for regeneration after logging.

Method of Cutting

Region 2's Management Guides for Lodgepole Pine, Englemann Spruce and Associated Species, FSH 2-2442.8, will be applied in timber marking. These management guides provide for clear cutting by patches or strips, with even-age management as the objective.

Growing Stock

The forest inventory divides the major timber types into stand-size classes and crown density classes. The definitions for these classes are Forest Survey standards.

The standard stand-size classes are:

Sawtimber	11.0 inches and larger d.b.h.
Poletimber	5.0 inches to 10.9 inches d.b.h.
Seedling-sapling	1/2 foot high to 4.9 inches d.b.h.
Nonstocked	

Stocking class or crown density class refers to the extent to which growing space is utilized by present growing stock trees of commercial species. The classification is based on the percent of crown closure. The stocking classes for sawtimber stands, as used in this plan, are for the percent of closure of sawtimber crowns. The stocking classes for poletimber and seedling-sapling stands are based on crown closure for all trees, regardless of their size.

Classification	Percent of Crown Closure
Nonstocked	0 to 9
Poorly Stocked	10 to 39
Medium Stocked	40 to 69
Well Stocked	70 +

Condition classes were not used in the survey. The breakdown into stand-size classes is purely on size and does not reflect the growing potential of the trees into the next larger size class. For example, considerable area of lodgepole pine that may never grow into sawtimber was typed out as poletimber. The trees are too old to put on additional growth. The lands supporting such overaged and stagnated stands can be put into growing condition only by removing the present stand and reforesting the area.

Because of the above described situation, it was necessary to adjust Forest Survey's area of lodgepole pine poletimber so that it would include only those stands having a chance of growing into sawtimber. This adjustment was made on the basis of the proportion of lodgepole pine site trees in the poletimber-size plots which were 70 years or less in age. Normally, stagnated poletimber-size stands over 70 years of age are not considered suitable for growing stock.

In this case, 59% of the site trees were 70 years or older. This was taken to indicate that 59% of the plots would fall in this age class, thus giving an indication of the acreage involved. For adjusting the stand-size classes to growing stock conditions, the 71,920 acres of lodgepole pine poletimber-size type is reduced to 29,600 acres, and the difference, 42,320 acres, is added to the nonstocked, since it has little growth potential. No adjustment is necessary for the spruce-fir type.

Table 11

Showing Area by Stand-Size
Classes and Adjustment for Growing Stock

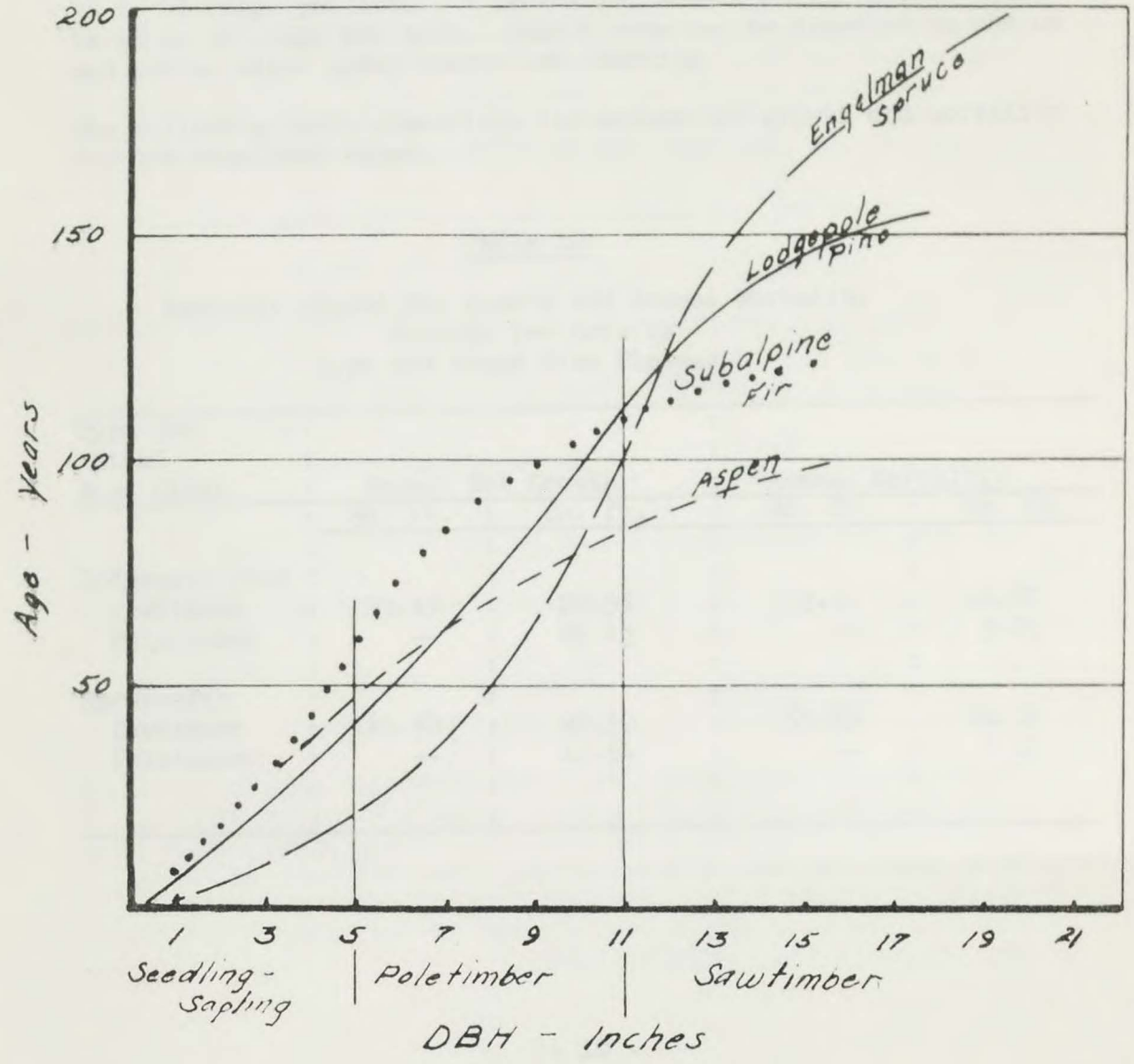
Stand-Size Class	Lodgepole Pine Type: Forest Survey Area		Lodgepole Pine Type: Area Adjusted to Reflect Growing Stock		Spruce-fir Type: Forest Survey Area	
	Acres	%	Acres	%	Acres	%
Sawtimber	60,670	43	60,670	43	65,630	83
Poletimber	71,920	50	29,600	21	8,711	11
Seedling-Sapling	8,335	6	8,335	6	880	1
Nonstocked	1,487	1	43,807	30	3,708	5
Total	142,412	100	142,412	100	78,929	100

The above table indicates there is a shortage of the seedling-sapling class and an overabundance of nonstocked area for a good distribution of stand-size classes in the lodgepole pine type. For the spruce-fir type, there is a shortage of area in poletimber and seedling-sapling size classes.

By applying a uniform rate of cutting to the lodgepole pine type, an acceptable distribution of age classes can be obtained beginning with the second rotation period. This also holds true for the spruce-fir type, provided it does not become necessary to step up the rate of cutting to prevent loss from mortality.

In order to get some relationship between stand-size classes and age, the plot site trees were plotted age over d.b.h. This graph is shown on Page 17. It is the only information available to indicate when the present stand-size classes reach rotation age and should be scheduled for cutting.

SHOWING COMPARISON BETWEEN AGE AND DBH OF SITE TREES (FOREST SURVEY)



Growth and Mortality

Growth and mortality are based on Forest Survey data. The calculation is explained under "Supporting Data."

This working circle did not have large losses of Engelmann spruce from bark beetles. There were only 130 acres typed out as dead spruce type. Most of the mortality is due to disease.

Growth within the lodgepole pine and spruce-fir types is considered good for wild stands. In fact, the growth is probably better than that on most other Colorado forests. Although empirical yield tables are not available, the stands can be expected to produce from 150 to 200 board feet under management.

Growth in most of the lodgepole pine poletimber size stands that are now averging approximately 90 years of age has slowed down to about 30 to 40 rings per inch. A desirable rate of radial growth would be 10 to 15 rings per inch. Such a rate can be expected on medium and better sites under controlled stocking.

The following table summarizes the annual net growth and mortality for the regulated types.

Table 12

Periodic Annual Net Growth and Annual Mortality
Average per Acre by
Type and Stand Size Classes

Type and Stand Size Class	Annual Net Growth		Annual Mortality	
	Bd. ft.	Cu. ft.	Bd. ft.	Cu. ft.
Lodgepole Pine				
Sawtimber	93.19	28.95	43.11	12.82
Poletimber	--	49.13	--	3.23
Spruce-Fir				
Sawtimber	113.78	26.59	55.29	16.14
Poletimber	--	17.64	--	7.15

Calculation of Allowable Cut

Lodgepole Pine Sawtimber Type

There are 60,670 acres of lodgepole pine sawtimber size type within the working circle. Most of this timber is overaged. The current periodic annual net growth is 28.95 cubic feet per acre in trees 5.0" d.b.h. and larger. The current annual mortality based on the past five years is estimated to be 12.82 cubic feet per acre. Considering the general age of the type, the annual net growth can be expected to decrease. In order to put the stand in good growing condition and to keep losses at a low level, this type-stand-size class will be scheduled for harvesting during the next 50 years. In other words, a 50-year adjustment period will be used to convert wild stands to a managed stand.

The allowable cut in area and volume is shown in Table 14 for each 10 years of the adjustment period. An equal volume of timber to be cut was set up for each 10 years. The area was then adjusted to reflect this volume.

The annual allowable cut based on the tabulation method for lodgepole pine sawtimber for the first ten years is:

Area	1,440 Acres
Volume	11,200 M B.F.

This compares favorably with other area calculations, as follows.

Straight area calculation based on rotation age:

$$\frac{142,412 \text{ acres}}{120 \text{ years}} = 1,187 \text{ acres per year.}$$

The Kemp formula gives 1,336 acres per year.

A straight area based on area of the sawtimber type divided by the adjustment period:

$$\frac{60,670 \text{ acres}}{50 \text{ years}} = 1,213 \text{ acres per year.}$$

The volume to be cut from the 1,440 acres of lodgepole pine type is obtained by applying the average volume per acre as shown in the stock and stand table and adding growth calculated at midpoint for the 10-year period. The following shows the estimated volume to be cut broken down by species. This is based on Scribner Dec. C log rule and is for trees 10.0" d.b.h. and larger in the sawtimber type.

Species	Percent of Volume	Volume MBF
Lodgepole pine	77.8	8,700
Engelmann spruce	15.0	1,700
Subalpine fir	5.2	600
Douglas fir	1.0	100
Aspen	1.0	100
Total	100	11,200

In addition to the above, the stock and stand table shows a volume of 851.98 cubic feet per acre in trees 5.0 to 9.9" d.b.h. that is unmerchantable for sawtimber but would be available for small round wood products such as pulpwood. This is referred to as the residual stand after clear cutting for sawtimber.

The total volume available for cutting would be:

1,440 acres x 851.98 = 1,227 M cubic feet per year.

Lodgepole Pine Poletimber Type

There are 71,920 acres of lodgepole pine poletimber size type within the working circle. This is broken down into crown stocking classes as follows:

	Acres	Percent
Well	51,458	71.5
Medium	15,037	21.0
Poor	5,425	7.5
Total	71,920	100

Most of this type was fire generated shortly after the county was settled in the 1870-80's. Most of the stands are around 80 to 90 years of age.

The periodic annual net growth based on the past 10 years is 49.13 cubic feet per acre. The average annual mortality based on the past five years is 3.23 cubic feet per acre.

The conversion from a wild to a managed stand will be scheduled over a 50-year adjustment period. This length period is adopted as it would coincide with that of a long-term pulpwood sale.

Future sawtimber harvesting will have to come from the presently typed poletimber size stands. As previously discussed, some of the poletimber type will never grow to sawtimber size. Only those younger stands occupying the better sites and having good crowns are likely to grow into a larger stand size class, provided the stocking can be controlled.

The cutting practice for this type will be to commercially thin those stands that are likely to grow to sawtimber size, and to clear cut and regenerate the remaining stands.

The acreage to be thinned or clear cut by crown density classes is based upon the percentage distribution of age class of site trees in the type and the prevalence of dwarfmistletoe in the various crown density classes.

Table 13

Acres to be Thinned or Clear Cut

By Crown Density Classes and Percent of Total Acres

Crown Density Class	Area to be Thinned		Area to be Clear Cut		Total Acres
	Acres	Percent	Acres	Percent	
Well	20,580	40	30,880	60	51,460
Medium	9,020	60	6,015	40	15,035
Poor	--	--	5,425	100	5,425
Total	29,600		42,320		71,920
Percent of Total	41		59		100

Table 14 gives the acreage and volume to be cut over during each 10-year period.

The annual allowable cut is:

Area - 1,900 acres

Volume - 3,500 M cubic feet

The volumes were taken from the stock and stand tables for the type and weighted in order to obtain an average for clear-cut and thinned areas. It is estimated that one-half the present volume on areas to be thinned will be cut. Net growth data was also weighted in order to obtain an average for the type.

The volume annual allowable cut of 3,500 M C.F. is broken down by species as follows:

Species	Percent	Volume (MCF)
Lodgepole pine	91.2	3,200
Subalpine fir	4.4	160
Engelmann spruce	2.4	80
Aspen	1.8	60
Douglas-fir	0.2	--
Total	100.0	3,500

Volume from Rethinned Poletimber Type

Volumes from rethinned areas are not included in the allowable cut since they will not be available for another 20 years. It is estimated that some 550 to 600 acres per year will be rethinned and approximately 20 cords per acre will be harvested.

Allowable Cuts Beyond the 50-Year Adjustment Period

At the end of 50 years of cutting at preceding allowable cuts, it is estimated that the distribution of stand size classes will be as follows:

	Present Adjusted Distribution for Growing Stock	Distribution at end of 50 years
Sawtimber	61 M acres	29 M acres
Poletimber	30	40
Seedling-Sapling	8	63
Nonstocked	43	10
Total	142	142

The allowable cut in acres by the Kemp formula, and based on a 120-year rotation, would be 1,254 acres.

Table 14 indicates that the allowable cut for sawtimber during the last part of the 50-year period will be 1,500 acres per year. The Kemp formula indicates that there should be a slight reduction in sawtimber cut at the end of the adjustment period. Pulpwood may come from intermediate cuts. There will be some 40,000 acres of poletimber type available for thinning at 20-year intervals. This would average out at 2,000 acres of thinning per year.

Table 14

Allowable Cut - Area and Volume - By 10-Year Periods
For the First 50 Years - Based on Current Rate of Growth

10-yr Period	Type and Stand Size Class	Area	Volume per Acre			Total Volume	Volume per Acre			Total Volume
			Present	Net Growth	Total		Present	Net Growth	Total	
		Acres	BF	BF	BF	MMBF	CF	CF	CF	MMCF
1st	Lodgepole pine									
	Sawtimber	14,400	7,533.35	465.95	7,799.45	112				
	Poletimber	19,000					1,626.52	196.40	1,822.92	35
	Spruce-fir									
	Sawtimber	7,800	12,157.47	568.90	12,214.36	95				
2nd	Lodgepole pine									
	Sawtimber	12,500	7,533.35	1,397.85	8,931.20	112				
	Poletimber	16,000					1,626.52	589.20	2,215.72	35
	Spruce-fir									
	Sawtimber	6,900	12,157.47	1,706.70	13,864.17	95				
3rd	Lodgepole pine									
	Sawtimber	11,400	7,533.35	2,329.75	9,863.10	112				
	Poletimber	13,500					1,626.52	982.00	2,608.52	35
	Spruce-fir									
	Sawtimber	6,300	12,157.47	2,844.50	15,001.97	95				
4th	Lodgepole pine									
	Sawtimber	10,400	7,533.35	3,261.65	10,795.06	112				
	Poletimber	11,500					1,626.52	1,374.80	3,001.32	35
	Spruce-fir									
	Sawtimber	5,900	12,157.47	3,982.30	16,139.77	95				
5th	Lodgepole pine									
	Sawtimber	9,500	7,533.35	4,193.55	11,726.90	112				
	Poletimber	10,000					1,626.52	1,767.60	3,394.12	35
	Spruce-fir									
	Sawtimber	5,500	12,157.47	5,120.10	17,277.57	95				

Total Area:	
Lodgepole pine	
Sawtimber	58,200
Poletimber	70,000
Spruce-fir	
Sawtimber	32,400

Spruce-Fir Sawtimber Type

There are 65,630 acres of spruce-fir sawtimber type within the working circle. Approximately 57 percent is over rotation age (140 years). The current periodic annual net growth is 113.78 board feet in trees 11.0" d.b.h. and larger, or 26.59 cubic feet in trees 5.0" d.b.h. and larger. The average annual mortality based on the past five years is 55.29 board feet in trees 11.0" d.b.h. and larger, or 16.14 cubic feet in trees 5.0" d.b.h. and larger.

Eighty-three percent of the spruce-fir type is in the sawtimber size class. The stand has been comparatively free of insects. Considering the condition of the stand, an adjustment period of 100 years will be used to convert from a wild stand to a managed stand. Such a period is desirable to maintain a suitable sawtimber cut after the 50-year adjustment period for lodgepole pine.

If, at the end of the first ten years, there is a material change in the rate of growth and mortality, the adjustment period may be shortened and salvage operations increased to prevent excessive loss.

The allowable cut in area and volume is shown in Table 14 for each 10-year period for the next 50 years. This was calculated on the tabulation method, figuring growth at the midpoint of each 10-year period. The acreage was adjusted to maintain an equal volume for each period.

For the first 10-year period, the average annual allowable cut is:

Area	780 acres
Volume	9,500 M B.F.

This may be compared with other area calculations as follows:

Straight area based on sawtimber type divided by the adjustment period,

$$\frac{65,630 \text{ acres}}{100 \text{ years}} = 656 \text{ acres per year.}$$

Straight area calculation based on rotation age of 140 years,

$$\frac{78,929 \text{ acres}}{140 \text{ years}} = 564 \text{ acres per year.}$$

The Kemp formula using 140 years rotation,

$$\frac{65,630 \times 7 + 8,711 \times 5 + 880 \times 3 + 3,708}{4 \times 140} = 909 \text{ acres per year.}$$

The volume to be cut from the regulated area was determined by applying the average volume per acre from the stock and stand table and adding the expected growth.

The following shows the estimated volume to be cut broken down by species. This is based on Scribner Dec. C log rule and is for trees 10.0" d.b.h. and larger in the sawtimber type. See Table 19.

Species	Percent of Volume	Volume MBF
Engelmann Spruce	73.3	7,000
Subalpine Fir	22.5	2,100
Lodgepole Pine	2.8	300
Douglas-fir	1.1	100
Aspen	0.3	--
	100.0	9,500

The above rate of cutting will produce an acceptable distribution of age classes during the second rotation period.

Calculation of Unregulated Cut

Aspen

There are 17,211 acres of aspen type within the working circle. Most of this has reached the pathological rotation age and should be cut. The average volume per acre is 998 cubic feet. The total volume for the type is 17,179 M cubic feet. Regulation of this type will not be needed until adequate markets are developed.

Douglas-fir Sawtimber Type

There are only 1,728 acres of Douglas-fir sawtimber in the working circle. This area supports 11,545 M B.F. of sawtimber. The type will not be regulated but will be harvested along with adjacent timber types.

Cutting Budget

The 10-year cutting budget is shown in Table 15 which follows. Selection of compartments in which future cutting will be done was based on the need for harvesting because of the age and condition of the stands within these compartments and for an orderly progress of logging over the working circle.

A pulpwood cutting budget will be firmed up within five years after the establishment of a pulp plant at Kremmling, Colorado. The first 5-year cut for such a plant is scheduled to come from the Yampa River and Arapaho Working Circles. The Parkview Compartment of the North Park Working Circle (No. 26) is to be cut for pulpwood during the last half of this 10-year period. It is estimated that there are approximately 140,000 cords of pulpwood, largely of lodgepole pine, available for cutting in the compartment. Under area control, this would amount to a 3-year cut. The total area of the lodgepole pine type in the compartment is 5,160 acres.

Since this compartment has been cut over for sawtimber, no construction of major roads will be needed.

TABLE 15

CUTTING BUDGET, NORTH PARK WORKING CIRCLE

No.	Compartment Name	FY To Be Sold	Acres to be Sold SF	Acres to be Sold LP	Acres to be Cut SF	Acres to be Cut LP	Volume to be cut MBM SF	Volume to be cut MBM LP
	TIMBER UNDER CONTRACT BUT UNCUT AT BEGINNING OF PERIOD							
34	Willow					10		85
16	Illinois				990		12,000	
26	Parkview				50		600	
19	Little Grizzly				74	828	900	7,100
20	Michigan River				49	933	600	8,000
2	Upper Muddy							
	FUTURE PROGRAM							
29	Rock Creek	1960	840	1,500	132	700	1,606	5,999
10	Buffalo	1960	1,250	1,475	200	700	2,433	5,999
7	Arapaho	1960	4,305	4,329	702	1,686	8,538	6,016
14	Colorado Creek (1)	1962	2,500	670	340	230	4,135	1,971
9	Beaver Creek	1963	1,655	3,453	788	1,600	9,584	13,712
15	Davis Creek	1963	2,052	4,301	800	2,000	9,730	17,140
14	Colorado Creek (1)	1966	2,500	670	400	100	4,865	857
3	Damfino	1966	957	3,483	400	1,700	4,865	14,569
4	East Fork	1966	5,344	2,431	1,175	1,020	13,545	8,741
20	Michigan River	1966	3,230	7,600	---	450	---	3,857
5	West Fork (2)	1969	4,101	3,913	No cut in this compartment during this period.			
6	S. Hog Park (2)	1969	2,550	2,571	No cut in this compartment during this period.			

(1) Colorado Creek will be divided into two sale areas.
(2) For cut in period 1970-1980

TRANSPORTATION

The road survey and construction program for the 10-year period has been scheduled in Table 16 which follows. This schedule is correlated with the cutting budget shown in Table 15.

As discussed under "Multiple-Use Coordination," the State Line Road (No. 2001) will be designed for all-purpose use but will be initially constructed, with the exception of a major bridge over the Encampment River, only to the standard necessary to remove the timber. The bridge will be constructed with all-purpose funds to avoid the necessity of reconstruction when the road is improved. The bridge will form the connecting link between the State Line Road and the Big Red Park Road No. 1945.

Rights-of-Way

A right-of-way will be required on State Line Road 2001.1 from Pearl, Colorado, to the Forest boundary for approximately two miles. An engineering survey will be made in FY 1961, and the right-of-way will be obtained by not later than FY 1962. There are no other rights-of-way necessary for this planned 10-year period.

Table 16

TEN YEAR ROAD PROGRAM, NORTH PARK WORKING CIRCLE

Compartment & No.	Road Name	Road No.	Class	Construction by	Miles	Average Cost per Mile	Total Cost	Date Survey Required	Sale Date (FY)	Remarks
Illinois Cr. 16	Jack Park	2035	SH	Operator	----	----		------	1960	Road constructed
Michigan Sub-Unit #1 20	Jack Creek	2029	SH	Operator	----	----		------	1960	Road constructed
Rock Creek 29	Rock Creek	2043	SH	Operator)	10.0	5,000	50,000	Complete	1960	New construction
Buffalo 10	Rock Creek	2043	SH	Operator)						
Arapaho 7	Bundy Park	2047	SH	Operator	4.0	5,000	20,000	Complete	1960	Reconstruction *
Arapaho 7	Bundy Park	2047.2	SH	Operator	3.4	8,823	30,000	Complete	1960	New construction.*
Arapaho 7	So. Arapaho	2049	SH	Operator	6.5	7,692	50,000	Complete	1960	New construction
Arapaho 7	East Fork	2048	SH	Operator	2.0	8,000	16,000	Complete	1960	New construction
Colorado Cr. 14	Hidden Lakes	2020	SH	Operator	1.5	13,333	20,000	61	1962	New construction
Beaver Cr. 9	Davis Cr.	2003	SH	Operator	7.0	8,571	60,000	61	1963	New construction
Davis Cr. 15	State Line	2001	SH	Operator	7.0	7,142	50,000	61	1963	New construction
Damfino 3	State Line	2001.3	SH	Operator	8.5	7,059	60,000	64	1966	New construction
East Fork 4	Stump Park	2119	SH	Operator	7.1	7,004	50,000	64	1966	New construction
East Fork 4	River Bridge Encampment	-----	DH	FS	----	20,000	20,000	64	1966	All-purpose
West Fork 5	West Fork	2000	SH	Operator	6.0	7,000	42,000	67	1969	New construction
So. Hog Park 6	So. Hog Park	1945	DH	FS	7.0	8,000	56,000	64	1966	All-purpose

* To be surfaced.

SALES POLICY

There is sufficient plant capacity at present in the North Park Working Circle to utilize the allowable cut of sawtimber. A three to five year supply of timber will be kept under contract to this industry at all times. If a situation develops in which the existing industry is unable to meet the allowable cut, additional timber will be advertised to attract outside or expanded industry.

The following is a guide for size of sales:

1. For the larger sawmills with a capacity of about 17 MM B.F. per year, sales should be 40 to 80 MM B.F. in size.

2. For the smaller mills with a capacity of 3 MM B.F., sales should be of about 10 MM B.F.

All sales in the working circle will be appraised to Walden.

Logging Methods

1. Lodgepole Pine

   Use of tractors and animals for logging is acceptable. Maximum skidding-tractor size and logging methods to be used will be discussed in the presale prescription and specified, as applicable, in the timber sale contract.

2. Spruce-Fir

   Use of the same logging equipment will be permitted in this type as in the lodgepole pine type. Special consideration, however, will be given to practices which will eliminate potential build-up of Engelmann spruce bark beetle populations in cull and large slash material. Complete slash disposal, entire-tree skidding with slash and cull disposal at the landing, or other such method will be considered for approval on an individual case basis.

Merchantability Specifications

Product and Species	Specification
Sawtimber	
	Trees
All species	10.0 inches d.b.h.
	Top Diameter
All species	8.0 inches d.i.b.
	Stump Height
All species	12 inches
Pulpwood	
	Trees
All species	5.0 inches d.b.h. and having sticks 8 feet long
	Top Diameter
All species	4.0 inches d.o.b.
	Stump Height
All species	8.0 inches

TIMBER STAND IMPROVEMENT

Regeneration

1. Planting

The total planting job to be done in the working circle by 1980 and that planned for accomplishment in the current 10-year period are shown in Table 17.

One-half the nonstocked and poorly stocked commercial forest land is scheduled for planting by 1970.

This area will be planted if the proposed pulp operation materializes. The area cut over prior to 1960 and in need of planting is based on that shown in the Planting Plan for the North Park Working Circle. One-third of the planned job for the 10-year period will be programmed for accomplishment between FY 1961 and 1965 and two-thirds between 1966 and 1970. This schedule will allow a gradual build-up of planting force.

The job in the spruce-fir type on areas currently being cut over is that of planting 300 Engelmann spruce trees per acre within one year after cutting. Natural regeneration will be depended upon for fill-in to proper stocking level.

When lodgepole pine stands having non-serotinous cones are logged, the area will be either seeded or planted within five years after harvesting. Each sale area will be examined for cone serotiny and the reforestation treatment will be included on the sale area prescription.

In addition to the above, there are some 18,800 acres of national forest lands that have been converted from conifers to aspen by fires. A part of this type now supports a coniferous understory of various degrees of stocking.

A planting survey will be needed to determine what areas should be planted, species, and what release cutting will be necessary in order to expedite the conversion back to a coniferous type. Such a planting survey will be made during the first half of this planning period. The planting job will then be incorporated in the plan of work for accomplishment prior to 1980.

2. Measures to Aid Natural Regeneration

Ground scarifying, slash burning, or other measures to help obtain natural regeneration will be done on 5,000 acres of cutover spruce-fir type and 6,000 acres of cutover lodgepole pine type on current timber sale areas.

Thinning

All sapling-size lodgepole pine stands will be given a noncommercial thinning financed largely from sale-area-betterment deposits, except that seedling-sapling stands that are over 70 years of age and overstocked to the point of stagnation will not be thinned. Stands that are not likely to grow into poletimber size under controlled stocking will be scheduled for destruction and regeneration.

Poletimber-size lodgepole pine stands less than rotation age will be subject to intermediate cuttings (thinnings) if all of the following requirements are met.

1. Volume - There must be an adequate stocking to permit the removal of a merchantable volume and leave approximately 80 square feet per acre of well spaced leave trees.

2. Site - The soil must be of medium or better depth; that is, the soil must be one foot or more in depth above bed rock. Numerous exposed rocks and outcrops denote shallow soils.

3. Crowns - A leave tree crown must make up at least 25 percent of the total height of the tree, it must be pointed or slightly rounded, of moderate or better density, and have good color, i.e., dark green.

4. Disease - Not more than 25 percent of the leave trees can be infected with dwarfmistletoe or stem canker, if such trees are needed to make up the reserved stand of 80 square feet of basal area.

It is estimated that 29,600 acres of poletimber-size stands will meet the above requirements. This area distributed over the 50-year adjustment period gives a goal of an average of 590 acres of thinning per year.

Dwarfmistletoe Control

Poisoning, girdling, or otherwise destroying the residual lodgepole pine stand infected with dwarfmistletoe will be done where the volume of such stand is less than five cords per acre. This job will amount to treating an average of 2,000 acres of cutover lodgepole pine type. On older sales where no sale-area-betterment funds are available, 2,000 acres will need control work. The latter job will be financed with regular funds.

Table 17

THE PLANTING JOB - FY 1961 to 1980

Type	Non-stocked* (Acres)	Understocked seedling-sapling stands* (Acres)	Pole stands to be clear cut** (Acres)	Planting needed on sawtimber areas cut over prior to FY 1960 (Acres)	Planting needed on: sawtimber areas to be cut over after FY 1960 (Acres)	Total
Lodgepole Pine	1,487	2,397	42,315	200	2,400	48,799
Spruce-Fir	3,708	840	---	1,080	13,000	18,628
Total	5,195	3,237	42,315	1,280	15,400	67,427

THE PLANTING JOB - FY 1961 to 1970

Type	Non-stocked* (Acres)	Understocked seedling-sapling stands* (Acres)	Pole stands to be clear cut** (Acres)	Planting needed on sawtimber areas cut over prior to FY 1960 (Acres)	Planting needed on: sawtimber areas to be cut over after FY 1960 (Acres)	Total
Lodgepole Pine	740	1,200	3,000	100	1,200	6,240
Spruce-Fir	1,760	400	---	540	6,500	9,200
Total	2,500	1,600	3,000	640	7,700	15,440

* Need for planting to be determined by intensive examination. Forest Survey did not consider reproduction less than 6" in height.

** Subject to establishment of a pulp mill tributary to the North Park Working Circle.

PROTECTION

Insects

Periodic outbreaks of the Engelmann spruce bark beetle (Dendroctonus engelmanni) have been noted and controlled in the spruce-fir types in the Illinois and Willow Creek compartments in the past 10 years. Minor outbreaks of other insect species have also been noted within the last 10-year period, but to date no control action has been advisable. Continued observations of these outbreaks are necessary. If there should be a marked build-up, control measures will be started.

The planned action for insect control is as follows:

1. Train all field-going personnel, seasonal and permanent, in detecting and reporting procedures for all species of destructive forest insects.

2. Train all timber purchasers to recognize and report infestations of the kind which can be expected within their operating areas.

3. Train other key people who will frequent forest areas to report any unusual insect activity. Examples of such key people would be stockmen, dude packers and State Game and Fish Conservation officers.

4. Each district will have an insect detection plan so that potential epidemics can be recognized and controlled.

5. In timber sales:

   a. All future sale contracts and modifications of existing contracts under which cutting will be done in the spruce-fir type will contain special insect-control clauses. These insect-control clauses will require the bunching and burning of all slash and cull material resulting either from tree-length logging or from bucking in the woods. The method used will be that which is the most practicable. Burning will be done by the Forest Service during the period the bark beetles are in the cull material.

   b. On areas where the above does not control the bark beetle infestation, or on small sales where such action is impracticable, a trap-tree program will be used.

Disease

1. Current Sales with Disease-Control Sale-Area-Betterment Provisions

Dwarfmistletoe infects 75-80% of the lodgepole pine type in this working circle. On sales having disease-control sale-area-betterment provisions, the following action will be taken:

a. Where the residual stand is less than five cords per acre:

Control by poisoning, girdling, or otherwise destroying residual trees on all patches or strips which have been clear cut. From 900 to 960 acres will be treated per year.

b. Where the residual stand is five cords or greater:

No control will be undertaken except with the approval of the forest supervisor. This action is specified because of the possibility of pulpwood operations in the working circle.

2. Current Sales Without Disease-Control Sale-Area-Betterment Provisions

Financing will be with regular (P&M) funds. On all sale areas where cutting was done less than 15 years ago, a survey will be made to determine the extent of the control needed and to prescribe measures to be taken. The same cord-per-acre classification used in item 1 above will be applied. On areas with less than five cords of residual stand, all control work will be accomplished by 1970. This will approximate 200 acres per year.

3. Older Sale Areas Not Clear Cut

At the present time, it is impracticable to control dwarfmistletoe in these stands. If research results in development of a control method during this period, consideration will be given to its application.

Animals

1. Porcupines

a. Instruct all Forest Service employees to kill porcupines.

b. Educate the public in the importance of controlling porcupines in timber management conservation.

c. Use poison control measures where necessary.

Fire

Timber cutting in the past has resulted in increasing the fire hazard through producing large areas of slash and unthinned reproduction. Provision is made in current sales for reduction of slash or for extra protection for slash areas until the hazard has been abated naturally.

The program for fire protection during this 10-year period is:

1. Reduce all slash areas to at least an MM fuel class within two years after logging.

2. Maintain a supply of equipment and a protection organization adequate to keep commercial timberland fires within the annual PAR set up in the fire prevention plan. The equipment and organization necessary will be specified in the fire step-up plan.

3. Use fire where practicable for insect and disease control.

4. Provide in all slash disposal plans, for the purchase of slash disposal equipment, such as tankers, chippers, pumps and firing equipment. Acquisition will continue until sufficient equipment is available to control slash on approximately 1,350 acres per year.

5. Continue the operation of the Owl Mountain Lookout, using a combination of extra protection and P&M funds, until natural abatement has reduced the hazard to tolerable limits in the Michigan River, Illinois, and Willow Creek compartments.

ACQUISITION

A key timber-producing tract to be acquired through exchange procedure is the land belonging to the State of Colorado in Section 16, T5N, R78W, 6th P.M. As of FY 1960, negotiations to acquire this tract have started. It is an isolated tract of state land with a considerable amount of pole-size timber which will contribute to the merchantable volume within this rotation period. In the event this tract is not acquired in the present exchange, continued efforts will be made to put this tract in Government ownership.

SUPPORTING DATA

Compartment Records

Within one year after the approval of this plan, a system of compartment records will be set up for each ranger district. This will consist of Form R2 2400-19 and a map for each compartment within the ranger district. These will be maintained in an atlas-size binder. The R2 2400-19 will be posted at least once annually. Since balances may be struck at any time, the form provides for a continuous inventory of the compartment. Compartment descriptions for at least those compartments scheduled for cutting during the 10-year period will also be included in the atlas binder. Such descriptions may be made on the back of R2 2400-19.

Timber Inventory

The inventory data on which this plan revision is made was obtained from the Cooperative Forest Survey--Region 2 Inventory Program conducted in 1957.

The inventory was conducted to standards prescribed and agreed to by Forest Survey of the Intermountain Forest and Range Experiment Station and the Division of Timber Management of Region 2 (Field Instruction for Forest Inventory, Rocky Mountain Region 1956). Forest Survey read the plots and processed the data. Region 2 delineated the types on aerial photographs, transferred the types to planimetric maps, printed the final type maps and calculated the area of the types.

Sampling Error

Volume data was based on plots taken at the following number of locations. Two plots were taken at each location.

Type	Stand Size Class	Stocking Class	No. of Locations
Douglas-fir	Sawtimber	All	5
Lodgepole pine	Sawtimber	All	38
Lodgepole pine	Poletimber	All	30
Lodgepole pine	Nonstocked	---	2
White & Limber pine	Sawtimber	Poor	1
Spruce-fir	Larger sawtimber	Well & Med.	5
Spruce-fir	Small sawtimber	All	63
Spruce-fir	Poletimber	Well	2
Spruce-fir	Poletimber	Medium	5
Spruce-fir	Poletimber	Poor	5
Spruce-fir	Seedling-sapling	Poor	1
Spruce-fir	Nonstocked	---	1
Dead spruce	-----	---	14
Aspen	Small sawtimber	All	8
Aspen	Poletimber	All	8
Aspen	Seedling-sapling	All	1
			189

It was estimated that the above number plots would give a sampling error in cubic foot volume of not to exceed five percent (one standard error) for the working circle.

There is no sampling error for the area estimates since such were based upon a 100 percent mapping job.

Data Processing

Forest Survey, of the Intermountain Forest and Range Experiment Station, processed the data through the IBM Section of the Pacific Southwest Station.

This was done in accordance with "Plan for Compilation of the Intermountain Forest Survey, Rocky Mountain Area by IBM Method" October 1, 1956, by Robert M. Miller.

The NFA Tables are on file in the Forest Supervisor's office. These are:

Area

NFA 2 - Compartment Area

NFA 3 - Block Area Summary

NFA 4 - Working Circle Area Summary

Volume

NFA 6 - Average volume per acre by volume stratum

NFA 7 - Average board foot volume per acre for sawtimber size trees by volume stratum

NFA 24 - Average past volume per acre by volume stratum (10 years past)

Miscellaneous Tables - Number of trees per acre and various Forest Survey summaries.

Copies of the plot tally sheets are on file in the Forest Supervisor's office.

Aerial photographs on which the photo interpretation was done are on file at the Denver Federal Record Storage Center.

Plates from which the type maps were printed are stored in the Division of Timber Management, Forest Service, Denver, Colorado.

Method for Calculating Periodic Annual Net Growth

Basic data are from Tables NFA 6 and 27 in Forest Survey IBM binder on file in Forest Supervisor's office.

Growth and mortality may be calculated for the volume stratum and for species within the volume stratum.

Merchantability Class 1 for each volume stratum in Table NFA 6 gives the present volume.

Merchantability Class 1 for each volume stratum in Table NFA 27 gives the volume 10 years ago.

The difference between the two is the gross ten-year growth.

Mortality is given under merchantability Class 7 in Table NFA 6. This is for a five-year period.

Mortality divided by five and subtracted from the annual gross growth gives the periodic annual net growth.

Table 18

RELATION BETWEEN SITE TREE AGE CLASSES AND SIZE CLASSES

Type	Age Class (Years)	Stand Size Class: Nonstocked No. Trees	Nonstocked %	Seedling-Sapling No. Trees	Seedling-Sapling %	Poletimber No. Trees	Poletimber %	Sawtimber No. Trees	Sawtimber %
Lodgepole Pine	1 - 19								
	20 - 39								
	40 - 59	3	100			13	21	1	1
	60 - 79					21	34	15	22
	80 - 99					15	24	16	23
	100 - 119					5	8	8	12
	120 +					8	13	29	42
Total		3	100			62	100	69	100
Engelmann Spruce	1 - 19								
	20 - 39					1	33		
	40 - 59					1	33	4	4
	60 - 79							8	8
	80 - 99							12	11
	100 - 119							13	12
	120 - 139							9	8
	140 +					1	34	62	57
Total						3	100	108	100
Subalpine Fir	1 - 19								
	20 - 39					1	5		
	40 - 59	2	100			5	26	1	3
	60 - 79					4	21	12	30
	80 - 99					2	11	8	20
	100 - 119			1	50	1	5	8	21
	120 - 139					3	16	2	5
	140 +			1	50	3	16	8	21
Total		2	100	2	100	19	100	39	100
Douglas-fir	140 +							4	100

Table 19

Summary of Total Area, Net Volume Per Acre and Total Volume by Species
For the Major Sawtimber Types

Types	Area Acres	Volume Per Acre (Bd. Ft.)	Species					
			Douglas-fir	Lodgepole Pine	Subalpine Fir	Engelmann Spruce	Aspen	Total
			M Bd. Ft.					
Douglas-fir	1,728	6,680.76	10,275	415	358	496	0	11,544
Lodgepole Pine	60,670	7,533.35	4,570	355,585	23,766	68,557	4,570	457,048
Spruce-Fir	65,630	12,157.47	8,777	22,341	179,526	584,857	2,394	797,895
Aspen	1,325	6,606.29	------	------	350	------	8,403	8,753
Total	129,353	9,858.60	23,622	378,341	204,000	653,910	15,367	1,275,240

Table 20

Summary of Annual Growth and Mortality
for Sawtimber Types

Types	Area	Board Feet in Trees 11.0" d.b.h and larger: Per Acre: Gross Growth	Mortality	Net Growth	Total Annual Net Growth	Total Annual Mortality	Cubic Feet in Trees 5.0" d.b.h. and larger: Per Acre: Gross Growth	Mortality	Net Growth	Total Annual Net Growth	Total Annual Mortality
	Acres	BF	BF	BF	MBF	MBF	CF	CF	CF	MCF	MCF
Douglas-fir	1,728	60.86	20.67	+40.19	69	36	16.87	10.30	+6.57	11	18
Lodgepole Pine	60,670	136.30	43.11	+93.19	2,615	5,654	41.77	12.82	+28.95	1,756	778
Spruce-Fir	65,630	169.07	55.29	+113.78	7,467	3,629	42.73	16.14	+26.59	1,745	1,059
Aspen	1,325	172.27	80.05	+92.27	122	106	53.81	20.43	+33.38	44	27
Total	129,353	152.28	72.86	79.42	10,273	9,425	42.04	14.55	27.49	3,556	1,882

Table 21

Average Net Volume and Annual Net Growth Per Acre
DOUGLAS-FIR SAWTIMBER TYPE
By Crown Density Classes and Species

Species	Crown Density Classes						Percent of Species Based on	
	Medium		Poor		Average			
	Bd. Ft.	Cu. Ft.	Bd. Ft.	Cu. Ft.	Bd. Ft.	Cu. Ft.	Bd. Ft.	Cu. Ft.
Douglas-fir	8,824.62	2,122.27	3,187.67	842.28	5,944.15	1,468.20	89.0	79.0
Lodgepole Pine			465.03	108.78	237.63	55.59	3.6	3.0
Subalpine Fir	422.30	334.91	--	131.42	206.50	230.93	3.1	12.5
Engelmann Spruce	202.40	43.24	378.70	157.99	292.48	101.88	4.3	5.5
Total	9,449.32	2,500.42	4,031.40	1,240.47	6,680.76	1,856.60	100.	100.
Annual Net Growth	+ 72.69	+ 4.59	+ 9.09	+ 8.47	+ 40.19	+ 6.57		
Annual Mortality	31.19	18.03	10.60	2.90	20.67	10.30		
Area in Volume Stratum - Acre		845.		883.		1,728.		
Percent of Area in Volume Stratum		48.90		51.10		100.		

Note - Board foot volume in trees 10.0" d.b.h. and larger.
Cubic foot volume in trees 5.0" d.b.h. and larger.

Table 22

STOCK AND STAND TABLE

DOUGLAS-FIR SAWTIMBER TYPE

By DBH and Crown Density Classes
Average per Acre

DBH Classes		Crown Density Classes								
		Medium			Poor			Average		
10" Class	2" Class	No. of Trees	Net Volume BF	Net Volume CF	No. of Trees	Net Volume BF	Net Volume CF	No. of Trees	Net Volume BF	Net Volume CF
0	1.0- 2.9	125			84			104		
	3.0- 4.9	375			0			183		
1	5.0- 6.9	12			17			15		
	7.0- 8.9	26		504.89	0		410.20	13		456.50
	9.0-10.9*	38	600.00		42	488.34		40	542.94	
2	11.0-12.9	24			16			20		
	13.0-14.9	14			6			10		
	15.0-16.9	12	6,264.33	1,482.29	3	3,084.87	738.70	7	4,639.63	1,102.32
	17.0-18.9	3			4			4		
	19.0-20.9	7			2			4		
3	21.0-22.9	8			2			5		
	23.0-24.9	0	2,584.99	513.24	0	458.19	91.57	0	1,498.20	297.77
	25.0-26.9	1			0			-		
	27.0-28.9	0			0			0		
Total		645	9,449.32	2,500.42	176	4,031.40	1,240.47	405	6,680.76	1,856.59

* Board foot volume in trees 10.0 to 10.9" DBH only.

Table 23

Average Net Volume and Annual Net Growth Per Acre

LODGEPOLE PINE SAWTIMBER TYPE
By Species and Crown Density Classes

Species	Crown Density Classes								Percent of Species Based on	
	Well		Medium		Poor		Weighted Average			
	BF	CF	BF	CF	BF	CF	BF	CF	BF	CF
Douglas-fir	0	0	0	0	141.79	30.85	76.62	16.67	1.0	0.7
Lodgepole Pine	11,587.80	2,640.40	8,429.16	2,296.99	3,647.82	1,574.85	5,853.54	1,907.66	77.8	74.7
Limber Pine	0	0	22.80	40.16	0	0	10.42	18.35	----	0.7
Subalpine Fir	1,332.50	549.54	624.89	370.30	185.94	153.84	389.52	253.79	5.2	9.9
Engelmann Spruce	2,196.50	571.87	1,821.54	449.49	535.90	150.05	1,127.76	287.98	15.0	11.3
Aspen	0	0	55.88	33.86	92.50	99.33	75.49	69.15	1.0	2.7
Total	15,116.80	3,761.81	10,954.27	3,190.80	4,603.95	2,008.92	7,533.35	2,553.60	100.0	100.0
Annual Net Growth	+ 24.85	- 00.44	+ 123.76	+ 26.70	+ 67.66	+ 31.00	+ 93.19	+ 28.95		
Annual Mortality	137.07	31.57	63.15	17.36	25.71	8.88	43.11	12.82		
Area in Volume Stratum:										
Acres	160		27,724		32,786		60,670			
Percent	00.26		45.70		54.04		100			

Note: Board foot volume is in trees 10.0" d.b.h. and larger, Scribner Dec. C Log Rule.
Cubic foot volume is in trees 9.0" d.b.h. and larger.

Table 24

STOCK AND STAND TABLE

LODGEPOLE PINE SAWTIMBER TYPE

By DBH and Crown Density Classes
Average per Acre

2" DBH Class	Crown Density Classes: Well			Medium			Poor			Average		
	No. of Trees	Net Volume Bd.Ft.	Net Volume Cu.Ft.	No. of Trees	Net Volume Bd.Ft.	Net Volume Cu.Ft.	No. of Trees	Net Volume Bd.Ft.	Net Volume Cu.Ft.	No. of Trees	Net Volume Bd.Ft.	Net Volume Cu.Ft.
1.0- 2.9	250	--	--	142	--	--	175	--	--	160	--	--
3.0- 4.9	0	--	--	47	--	--	74	--	--	61	--	--
5.0- 6.9	25	--	102.12	54	--	144.77	66	--	167.94	60	--	157.17
7.0- 8.9	38	--	237.49	43	--	294.40	69	--	497.77	57	--	404.15
9.0-10.9*	12	--	152.40	45	883.06	563.12	39	706.50	476.46	42	785.31	515.20
11.0-12.9	40)			37)			19)			27)		
13.0-14.9	36)			23)			7)			14)		
15.0-16.9	16)	15,116.80	3,269.80	9)	9,421.25	2,071.02	3)	3,368.29	767.83	6)	6,165.07	1,369.93
17.0-18.9	6)			4)			4)			4)		
19.0-20.9	3)			0)			1)			1)		
21.0-22.9	0			1	426.07	78.45	1	529.16	98.92	1	480.66	89.31
23.0-24.9												
25.0-26.9												
27.0-28.9												
29.0-30.9												
31.0-32.9					223.89	39.04					102.31	17.84
Total	426	15,116.80	3,761.81	405	10,954.27	3,190.80	458	4,603.95	2,008.92	433	7,533.35	2,553.60

Note: *Board foot volume in 9.0-10.9 two-inch DBH class is for 10.0-10.9 DBH only.

Table 25

Average Net Volume and Annual Net Growth Per Acre

LODGEPOLE PINE POLETIMBER TYPE

By Species and Crown Density Classes

Species	Crown Density Classes				Percent by Species
	Well	Medium	Poor	Average	
	CF	CF	CF	CF	
Douglas-fir	---	3.40	33.54	3.24	0.2
Lodgepole Pine	2,046.76	1,328.36	1,186.19	1,831.65	91.2
Subalpine Fir	82.68	134.95	6.53	87.86	4.4
Engelmann Spruce	37.87	80.93	67.24	49.08	2.4
Aspen	20.18	108.51	---	37.13	1.8
Total	2,187.49	1,656.15	1,293.50	2,008.96	100.0
Annual Net Growth	+ 55.23	+ 34.02	+ 33.24	+ 49.13	
Annual Mortality	2.79	4.49	3.94	3.23	
Area in Volume Stratum					
Acres	51,458.	15,037.	5,425.	71,920.	
Percent	71.55	20.91	7.54	100.00	

Note: Volume is in trees 5.0" d.b.h. and larger.

Table 26

STOCK AND STAND TABLE

LODGEPOLE PINE POLETIMBER TYPE

By DBH and Crown Density Classes
Average per acre

DBH Classes		Crown Density Classes									Weighted Average		
		Well			Medium			Poor					
10" Class	2" Class	No. of Trees	Net Volume Cu.Ft.	Basal Area Sq.Ft.	No. of Trees	Net Volume Cu.Ft.	Basal Area Sq.Ft.	No. of Trees	Net Volume Cu.Ft.	Basal Area Sq.Ft.	No. of Trees	Net Volume Cu.Ft.	Basal Area Sq.Ft.
0	1.0- 2.9	400	--	8.80	282	--	6.20	125	--	2.75	355	--	7.81
	3.0- 4.9	150		13.05	76		6.61	62		5.39	128		11.14
1	5.0- 6.9	218	594.99	42.73	96	253.98	18.82	82	155.57	16.07	182	490.54	35.67
	7.0- 8.9	120	871.35	41.88	85	534.06	29.66	112	620.92	39.09	112	781.94	39.09
	9.0-10.9	38	439.85	20.71	44	515.84	23.98	37	405.53	20.16	39	453.15	21.26
2	11.0-12.9	8		6.28	12		9.42	5		3.92	9		7.06
	13.0-14.9	4		4.28	3		3.21	0		0	3		3.21
	15.0-16.9	1	281.30	1.40	1	352.27	1.40	0	111.50	0	1	283.33	1.40
	17.0-18.9	0		0	0		0	1		1.77	0		0
	19.0-20.9	0			0			0			0		0
Total		939	2,187.49	139.13	599	1,656.15	99.31	424	1,293.52	89.15	829	2,008.96	126.64

Table 27

Average Net Volume and Annual Net Growth Per Acre

SPRUCE-FIR SAWTIMBER TYPE
By Stand Size Classes, Crown Density Classes and Species

Species	Stand Size and Crown Density Class								Weighted Average		Percent of Species Based On	
	Large Sawtimber		Small Sawtimber									
	Medium & Poor		Well		Medium		Poor					
	BF	CF	BF	CF	BF	CF	BF	CF	BF	CF	BF	CF
Douglas-fir	0	0	0	0	264.55	54.40	0	0	138.54	28.49	1.1	1.0
Lodgepole Pine	0	0	0	0	439.94	94.71	237.55	61.04	336.63	76.90	2.8	2.6
Subalpine Fir	1,939.07	484.19	4,330.84	1,356.37	3,436.68	1,170.80	1,887.26	787.07	2,732.73	991.08	22.5	33.6
Engelmann Spruce	34,558.47	6,201.38	15,556.28	3,062.37	11,355.68	2,264.90	4,959.38	1,137.21	8,912.03	1,832.46	73.3	62.1
Aspen	0	0	0	0	0	0	83.95	48.51	37.54	21.69	0.3	0.7
Total	36,497.54	6,685.57	19,887.12	4,418.74	15,496.85	3,584.81	7,168.14	2,033.83	12,157.47	2,950.62	100.0	100.0
Annual Net Growth	+133.76	+ 14.25	+ 138.81	+ 3.62	+ 112.49	+ 22.99	+113.85	+ 31.94	+ 113.78	+ 26.59		
Annual Mortality	162.63	35.12	119.20	41.08	76.65	22.38	24.62	7.42	55.29	16.14		
Area in Volume Stratum:												
Acres	1,020		895		34,365		29,350		65,630			
Percent:	1.55		1.36		52.37		44.72		100			

Note: Board foot volume is in trees 10.0" d.b.h. and larger.
Cubic foot volume is in trees 5.0" d.b.h. and larger.

Table 28

STOCK AND STAND TABLE

SPRUCE-FIR SAWTIMBER TYPE

By DBH and Crown Density Classes
Average per Acre

DBH Classes	Stand Size and Crown Density Classes												Weighted Average		
	Large Sawtimber			Small Sawtimber											
	Medium and Poor			Well			Medium			Poor					
	**	Net Volume		**	Net Volume		**	Net Volume		**	Net Volume		**	Net Volume	
10" 2"	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.
0 1.0- 2.9	100	--	--	0	--	--	125	--	--	126	--	--	122	--	--
3.0- 4.9	0	--	--	0	--	--	83	--	--	81	--	--	79	--	--
1 5.0- 6.9	5	--	--	45	--	--	48	--	--	51	--	--	48	--	--
7.0- 8.9	5	--	35.15	25	--	458.57	35	--	673.65	42	--	660.20	37	--	654.81
9.0-10.9*	--	--	--	20	180.00		31	816.35		27	447.70		28	630.18	
2 11.0-12.9	8			38			20			16			18		
13.0-14.9	11			34			20			9			20		
15.0-16.9	11	13003.78	2995.05	24	17590.20	3583.04	10	11347.47	2315.15	7	4973.95	1056.06	9	8607.80	1772.12
17.0-18.9	18			11			11			4			8		
19.0-20.9	9			6			7			2			5		

Table continued on following page.

* Board foot volume is for trees 10.0 to 10.9" DBH only.
** No. refers to number of trees.

Table 28 (Continued)

STOCK AND STAND TABLE

SPRUCE-FIR SAWTIMBER TYPE

By DBH and Crown Density Classes
Average per Acre

DBH Classes	Stand Size and Crown Density Classes												Weighted Average		
	Large Sawtimber			Small Sawtimber											
	Medium and Poor			Well			Medium			Poor					
	**	Net Volume		**	Net Volume		**	Net Volume		**	Net Volume		**	Net Volume	
10": 2"	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.	No.	Bd.Ft.	Cu.Ft.
3 :21.0-22.9	9			3			2			1			2		
:23.0-24.9	7			1			2			--			1		
:25.0-26.9	3	16098.29	2848.70	0	2116.92	377.13	1	3089.85	552.75	2	1746.49	317.57	1	2677.50	480.78
:27.0-28.9	4						1			--			--		
:29.0-30.9	3						--			--			--		
4 :31.0-32.9	1												--		
:33.0-34.9	3												--		
:35.0-36.9	--	6389.31	1132.49	0	0	0	0	243.18	43.26	0	0		--	226.39	40.21
:37.0-38.9	1												--		
:39.0-40.9	--												--		
5 :41.0-42.9	1	1006.16	174.18	0	0	0	0	0	0	0	0	0	--	15.60	2.70
Total	199	36497.54	7185.57	207	19887.12	4418.74	396	15496.85	3584.81	368	7168.14	2033.83	378	12157.47	2950.62

** No. refers to number of trees.

Table 29

Average Net Volume and Annual Net Growth Per Acre

ASPEN TYPE

By Stand Size Classes and Species

Species	Sawtimber			Poletimber	
	Net Volume per Acre		Percent of Species	Net Volume per Acre	Percent of Species
	Bd. Ft.	Cu. Ft.		Cu. Ft.	
Lodgepole Pine	---	---	---	20.97	2
Subalpine Fir	248.81	62.30	4	---	---
Engelmann Spruce	---	---	---	9.32	1
Aspen	6,357.48	2,065.40	96	874.01	97
Total	6,606.29	2,127.70	100	904.30	100
Annual Net Growth	+ 92.22	+ 33.38		+ 33.26	
Annual Mortality	80.05	20.43		0.17	
Area in Type	1,325			15,886	

Note: Board foot volume is in trees 10.0" d.b.h. and larger.
Cubic foot volume is in trees 5.0" d.b.h. and larger.

Table 30

STOCK AND STAND TABLE

ASPEN TYPE

By Stand Size Classes and DBH Classes
Average per Acre

DBH Class		Sawtimber Type				Poletimber Type		
			Net Volume		Basal Area		Net Volume	
10" Class	2" Class	No. of Trees	Bd. Ft.	Cu. Ft.	Sq. Ft.	No. of Trees	Cu. Ft.	Sq. Ft.
0	1.0- 2.9	31	--	--	0.68	250	--	5.50
	3.0- 4.9	95	--	--	8.26	94	--	8.18
1	5.0- 6.9	71			13.92	91		17.84
	7.0- 8.9	44		752.28	15.36	34	688.75	11.87
	9.0-10.9*	23	310.97		12.53	16		8.72
2	11.0-12.9	21			16.48	6		4.71
	13.0-14.9	15			16.04	2		2.14
	15.0-16.9	8	5,710.07	1,261.44	11.17	1	215.55	1.40
	17.0-18.9	5			8.84	0		0
	19.0-20.9	1			2.18	1		2.18
3	21.0-22.9	2	585.25	113.98	5.28	0	0	0
	23.0-24.9	0				0		
	25.0-26.9	0				0		
	27.0-28.9	0				0		
	29.0-30.9	0				0		
Total		316	6,606.29	2,127.70	110.74	495	904.30	62.54

Note * Board foot volume is for trees 10.0-10.9" d.b.h.

2400

COMPARTMENTS.

North Park Working Circle	Yampa River Working Circle
001 Big Grizzly	001 California Park
002 Upper Muddy	002 Fortification
003 Demfino	003 Four Mile
004 East Fork	004 Grizzly Park
005 West Fork	005 Little Bear
006 South Hog Park	006 North Elkhead
007 Arapaho	007 Roaring Fork
008 Bear Creek	008 Slater Park
009 Beaver Creek	009 Smith Creek
010 Buffalo	010 South Slater
011 Brown Creek	011 South Snake
012 Camp Creek	012 Blacktail Creek
013 Chedsey Creek	013 Fish Creek
014 Colorado Creek	014 Green Creek
015 Davis Creek	015 Harrison Creek
016 Illinois	016 Morrison Creek
017 Laurel	017 Rock Creek
018 Lone Pine	018 Service Creek
019 Little Grizzly	019 Silver Creek
020 Michigan River	020 Soda Creek
021 Mt. Ethel	021 Toponas Creek
022 Newcomb Creek	022 Walton Creek
023 Norris Creek	023 Wheeler Basin
024 North Platte	024 Big Creek
025 Owl	025 Columbine
026 Parkview	026 Floyd Creek
027 Pinkham	027 Grouse Mountain
028 Red Canyon	028 Hinman Creek
029 Rock Creek	029 King Solomon
030 Schafer	030 Mad Creek
031 Tepee Creek	031 Middle Elk
032 Twisty Park	032 Middle Snake
033 Ute Creek	033 North Elk
034 Willow	034 Reed Creek
035 Colorado State Forest	035 Round Mountain
	036 Sand Creek
	037 Sand Mountain
	038 South Elk
	039 Summit Creek
	040 Tennessee
	041 Whiskey Park
	042 Bear River
	043 Beaver Creek
	044 Bunker Creek
	045 Cyclone Creek
	046 Egeria Creek
	047 Dunkley
	048 Hunt Creek
	049 Lost Lakes
	050 Moody Creek
	051 Oak Creek
	052 Pine Creek
	053 Poose Creek
	054 Sand Peak
	055 Trout Creek

ROAD DESIGNATIONS

1901 – Fourmile
1905 – Lost Park
1906 – West Prong
1913 – Elkhead
1914 – Sawtooth
1926 – Floyd Creek
1939 – Whiskey Park
1941 – Stock Driveway
1942 – Whiskey Park Branch
1943 – Little Snake Branch
1945 – Red Park
1946 – Silver City
1954 – Diamond Park
1956 – Lost Dog
1980 – Service Creek
1981 – Silver Creek
1982 – Gore Peak
1993 – Big Rock Creek
2000 – West Fork
2001 – State Line
2003 – Davis Creek
2020 – Hidden Lakes
2043 – Rock Creek
2047.2 – Bundy Park
2047.3 – Bundy Park
2048 – East Fork
2049 – South Arapaho
2098 – Scott Run
2099 – East Lost Dog
2119 – Stump Park

2- YAMPA RIVER W.C.

1- NORTH PARK W.C.

KEY MAP
ROCKY MOUNTAIN REGION

FOREST SERVICE
MAP CLASSIFICATION AREAS

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
RICHARD E. MCARDLE, CHIEF

ROUTT NATIONAL FOREST

COLORADO
SIXTH PRINCIPAL MERIDIAN
1958

WORKING CIRCLE MAP OF ROUTT NATIONAL FOREST

10/11/55
Revised: 2/5/57 - 4/30/57 - 2/3/59 - 12/24/59

LEGEND

- Working Circle Boundary
- Compartment Boundary
- Roads to be Constructed - F.Y. 1961 to F.Y. 1970
- Compartments to be Cut Over - F.Y. 1961 to F.Y. 1970

Compiled and drawn at Regional Office, Denver, Colo. - 1957 from Forest Service planimetric maps and U.S.G.S. topographic maps constructed by photogrammetric methods from aerial photographs.
Control by U.S. Coast and Geodetic, U.S. Geological and Forest Service surveys.